

Claims

- [c1] 1. A detecting method for a dry etching machine, comprising:
perform an etching process on a preset number of wafers, wherein Vpp values with respect to the wafers are recorded in the etching process;
obtaining a Vpp range under a working condition, according to the Vpp values of the wafers;
feeding the Vpp range to a control system of the dry etching machine; and
comparing Vpp values for a subsequent wafer under the etching process, wherein when the Vpp values are out of the Vpp range, then the control system of the dry etching machine enters an abnormal operation mode.
- [c2] 2. The method according to claim 1, wherein the preset number of the wafers is equal to or greater than 200.
- [c3] 3. The method according to claim 1, wherein the Vpp range is determined according to a mathematical analyzing algorithm.
- [c4] 4. The method according to claim 1, wherein when the etching machine enters the abnormal operation mode,

the control system stops the etching machine.

- [c5] 5. The method according to claim 1, wherein when the etching machine enters the abnormal operation mode, the control system issues a warning signal.
- [c6] 6. The method according to claim 1, wherein a situation that the Vpp values are out of the Vpp range is caused by the pad layer, with thermal conducting but electrical insulation, on an E-chuck (ESC) being broken.
- [c7] 7. The method according to claim 1, wherein a situation that the Vpp values are out of the Vpp range is due to helium leakage, which is used to chill the wafers, caused by breakage of the transport pipe of internal helium gas in the E-chuck (ESC).
- [c8] 8. The method according to claim 1, wherein a situation that the Vpp values are out of the Vpp range is due to over temperature on the bottom of the etched wafer.
- [c9] 9. The method according to claim 1, wherein a situation that the Vpp values are out of the Vpp range is caused by insufficient performance of a chilling system.
- [c10] 10. The method according to claim 1, wherein a situation that the Vpp values are out of the Vpp range is caused by the abnormal oxygen flowing rate.

- [c11] 11. The method according to claim 1, wherein a situation that the Vpp values are out of the Vpp range is caused by a defect of the etched wafer itself.
- [c12] 12. The method according to claim 1, wherein the dry etching machine is used in a deep trench process for dynamic random access memory (DT-DRAM).
- [c13] 13. The method according to claim 12, wherein the deep trench process uses a reaction ion etching process (DT-RIE).